

**Appendix F**  
**Illicit Discharge Investigation and Elimination Guidance**

## **F.1 INTRODUCTION**

Once illicit discharges/disposal are detected and identified, they must be eliminated. Sometimes the source of the spill or discharge/disposal is apparent. The incident can be removed through voluntary cleanup/termination or enforcement procedures, and steps can be taken to prevent its recurrence. These prevention methods can include education and outreach materials for residents and businesses; preventive maintenance practices for infrastructure, vehicles and equipment; or additional enforcement.

When the source of the discharge is not apparent, further investigation will be necessary to eliminate it and prevent it from recurring. The following discusses methods that can be used to document the incident, determine the nature of the material, and investigate the source.

## **F.2 ADVANCE PLANNING**

An effective investigation program requires good advance planning. Sufficient staff should be trained to conduct investigations so that qualified staff are available whenever investigations are necessary. Staff should become familiar with illicit discharge investigation and sampling procedures. A good source of information includes *Investigation of Inappropriate Pollutant Entries into Storm Drainage Systems* (EPA/600/R-92/238, 1993, Pitt et al.) or on the web at <http://www.epa.gov/ednnrmrl/repository/cross/cross.htm>. General guidance follows below to assist with overall planning, but should not be considered complete for proper sampling quality assurance purposes.

### **F.2.1 Equipment**

Appropriate equipment for field investigations may include:

- Inspection checklists
- Storm drain system map
- Field data log book
- Pens, pencils
- Camera and film
- Flashlight
- Graduated container
- Tape measure

## **Appendix F**

### **Illicit Discharge Investigation And Elimination Guidance**

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- Ping pong ball or other light floatable
- Stopwatch
- Temperature/pH/conductivity (EC) probe
- Field test kits (e.g., Lamotte test kit)
- 12 1-liter amber glass sample bottles
- 12 1-liter HDPE sample bottles
- Cooler with ice for sample preservation
- Gloves
- Splash goggles/safety glasses
- Deionized water in wash bottle
- First aid kit

#### **F.2.2 Data Collection**

Before entering the field, the inspection crew should locate information such as the following on a storm drain/street map for areas that will be investigated:

- All known or suspected pollutant generating activities
- Locations of NPDES dischargers
- All locations where storm drains enter open channels
- Catch basins and storm drain manholes

#### **F.3 VISUAL OBSERVATION**

Visual observation of the storm drain system and/or of activities on the surface can provide information on the source of illicit discharges. It is the simplest method to begin with and the least costly. Evidence of illicit discharges may only consist of visual observations because most illicit discharges are intermittent and will probably not be flowing when inspected. A field inspection crew should investigate the surface drainage system in the vicinity of suspected illicit discharges. This may include accessible areas in the public right-of-way adjacent to residences and businesses, catch basins, open channels near known points of discharge, and upstream manholes.

Photos of visual observations should be taken to aid subsequent data analysis and follow-up planning. The following types of visual observations should be recorded on an investigation checklist, such as the one attached to this appendix:

- Location
- General site description
- Amount, appearance of discharge/disposal
- Stains
- Structural cracking and corrosion
- Vegetative growth
- Nearby facilities with poor outside housekeeping practices
- Pipes/hoses connected to/directed toward drainage system

If the source of the discharge is determined, appropriate methods should be used to eliminate it through voluntary cleanup/termination or enforcement procedures, and steps should be taken to prevent its recurrence.

#### **F.4 SAMPLING AND TESTING**

If flow is observed, and the source of the discharge is not apparent, the crew should collect a sample and measure flow. Several tests should be conducted to determine the nature of the material. This can be compared to records of local facilities and possible pollutant generating activities as an aid in determining the possible sources of the flow.

The sample should be measured for pH, temperature and conductivity (EC). If any of these parameters are abnormal, or strong odors or flow discoloration are detected, the sample should be analyzed. This can be done with a field test kit, which will detect the presence of copper, phenols, detergents, and chlorine. Findings should be recorded on the inspection checklist.

If visual observations are abnormal and/or the field tests detect high concentrations of any constituent, the crew should consider collecting samples for laboratory analysis. The laboratory can usually supply properly cleaned sample bottles and specify either amber glass or plastic (HDPE) bottles depending on the analyses required. If there is enough flow, the field crew should fill several of each type of bottle to obtain enough sample volume for a range of analyses. If there is a limited quantity or sampling is difficult, the field crew should collect as much sample as possible so that the laboratory can run a limited set of analyses. The samples should be placed in a cooler filled with ice and transported to the lab(s) on the same day. Arrangements should be made prior to the field inspection with an analytical laboratory capable of performing the required analyses.

The laboratory analyses run on each sample should be carefully considered. Given the potential high cost for laboratory work, it is prudent to limit the number of analytical

**Illicit Discharge Investigation And Elimination Guidance**

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parameters (or analytes) tested for each sample. Tests may be selected based on the findings of indicator analyses, visual observations, field tests, and information collected about the types of materials processed, stored and/or spilled within each drainage area.

Guidance to selecting appropriate sampling methods and analyses can be found in the document referenced in Section F.2.

# Appendix F

## Illicit Discharge Investigation And Elimination Guidance

ILLICIT DISCHARGE/CONNECTION FIELD INVESTIGATION CHECKLIST							
Field Site Description							
Location:							
Dominant Watershed Land Uses:							
Industrial	Commercial	Residential	Public	Unknown			
Illicit Connections							
Connection found?	Station:			Type:			
	Size:			Bank:			
Discharge Observations							
Surface I.D.				Channel I.D.			
Flow (Yes/No)				(If yes, how much flow )			
If "yes" check:							
<b>Odor:</b>	None	Musty	Sewage	Rotten Eggs	Sour Milk	Oily	Other _____
<b>Color:</b>	Clear	Red	Yellow	Brown	Green	Grey	Other _____
<b>Turbidity:</b>	Clear	Cloudy	Opaque	Suspended Solids	Other _____		
If "yes" or "no" check:							
<b>Deposits/Stains:</b>	None	Sediments	Oily	Garbage	Other _____		
<b>Structural Condition:</b>	Normal	Concrete Cracking	Metal	Corrosion	Other _____		
<b>Vegetation Conditions</b>	None	Mosquito Larvae	Algae	Other _____			
<b>Picture Taken:</b>	Yes/No	Roll No. _____		Photo No. _____			
Field Analysis (Parameters Optional)							
Water Temperature:		(C)	Chlorine (total):		(mg/L)		
Dissolved Oxygen:		(mg/L)	Copper (total):		(mg/L)		
Phenol (total):		(mg/L)	Detergents (surf):		(mg/L)		
PH:							
Comments:							
Source Investigation							
Investigation Conducted?		Y	N	Source Identified?		Y	N
Name and Address of Identified Source/Owner of Discharge/Connection:							
Comments:							
Inspector Data							
Data Sheet filled out by:				Date:			
Signature:							